

## MAP 4319: INDUSTRIAL PROBLEMS IN APPLIED MATH

**Department of Mathematical Sciences**  
**Spring 2024**  
**Credit Hours: 3**

**CRN: 11091 / 10775**  
**Lecture Times: MWF 1:00 PM – 1:50 PM**  
**Location: Physical Science (PS-55) 113**

**Prerequisites:** MAP 2302 or MAP 3305, and MAS 2103 or MAC 2313 or permission of instructor.

### CONTACT INFORMATION

**Instructor:** Dr. Zvi Rosen

**Office Location:** SE 224

**Office Hours:** Wednesday 11:00 AM – 12:00 PM, Thursday (Zoom) 11:00 AM – 12:00 PM

**Email:** [rosenz@fau.edu](mailto:rosenz@fau.edu)

### COURSE DESCRIPTION

This course, backed by the PIC Math program—supported by the Mathematical Association of America (MAA), the Society for Industrial and Applied Mathematics (SIAM), and the National Science Foundation (NSF)—aims to immerse math majors in industrial research, equip them for careers in industry, and introduce them to real-world mathematical challenges beyond academia. Throughout this course, groups of 3-5 students collaborate on semester-long projects sourced from external industry partners. The primary goal is for students to experience firsthand how mathematics is applied in practical, real-world settings.

*From the FAU Catalog:* This research-intensive course pits students in small groups against real-world problems provided by industrial partners.

### COURSE OBJECTIVES

Upon successful completion of this course, students will be able to:

1. Formulate mathematical statements based on partner's open-ended objectives.
2. Plan and implement a large-scale mathematical project.
3. Apply a variety of mathematical tools to real-world situations.
4. Effectively communicate mathematical ideas to a general audience.

## COURSE DELIVERY MODE

This is an **in-person** course. Class time will be largely devoted to group work on research projects, though there will be occasional lectures when the instructor deems helpful.

## TIME COMMITMENT PER CREDIT HOUR

This course has three (3) credit hours. For traditionally delivered courses, not less than one (1) hour of classroom or direct faculty instruction each week for fifteen (15) weeks per Fall or Spring semester, and a minimum of two (2) hours of out-of-class student work for each credit hour.

## REQUIRED TEXT

There is no required textbook for this course. Readings may be provided by the professor.

## COURSE ASSESSMENTS, ASSIGNMENTS & GRADING POLICY

### GRADING CRITERIA

#### CLASS ATTENDANCE / PARTICIPATION (TOTAL 15%, EACH CLASS)

Class time will be your main team meeting time. For this reason, attendance and active participation are key. If you miss class without justification, you will receive a 0 for the day.

#### TIME-SHEETS / PERSONAL EVALUATIONS (TOTAL 15%, EVERY OTHER WEEK)

Each student will be making a unique contribution to their team project. In order to track that contribution, and keep your team moving in the right direction, there will be a biweekly timesheet and personal evaluation. This document will also allow you to discuss any issues being encountered in the team dynamic.

#### BIWEEKLY PRESENTATIONS (TOTAL 15%, EVERY OTHER WEEK)

Every other Friday, students will be able to present the progress of the preceding two weeks to their peers. Every team member should take a turn presenting as part of one slide show.

#### BIWEEKLY REPORTS (TOTAL 15%, EVERY OTHER WEEK)

Every two weeks the group will collaborate to compile what it has been thinking about in the past couple of weeks. The writeup will include technical discussion of the results, and an informal reflection on the progress of the project.

#### FINAL GROUP PRESENTATION (TOTAL 20%, END OF THE SEMESTER)

The group will give a final presentation describing their results to their industry partner. The presentation will be held during the final exam period for this course and will be only 12 minutes long.

#### FINAL GROUP TECHNICAL REPORT (TOTAL 20%, END OF THE SEMESTER)

The group will also submit a technical report 10 – 12 pages long written in LaTeX. A first draft of the report including bibliography will be due the last day of class before Spring Break.

| Assessment                                  | Percentage (%) |
|---------------------------------------------|----------------|
| Class Attendance / Participation            | 15%            |
| Biweekly Time-sheets / Personal Evaluations | 15%            |
| Biweekly Presentations                      | 15%            |
| Biweekly Reports                            | 15%            |
| Final Group Presentation                    | 20%            |
| Final Group Technical Report                | 20%            |
| <b>TOTAL:</b>                               | <b>100%</b>    |

#### GRADE SCALE

| Grade | Percentage (%) |  | Grade | Percentage (%) |
|-------|----------------|--|-------|----------------|
| A     | 90 – 100%      |  | C+    | 70 – 76%       |
| A-    | 87 – 89%       |  | C     | 64 – 69%       |
| B+    | 84 – 86%       |  | C-    | 60 – 63%       |
| B     | 80 – 83%       |  | D     | 50 – 59%       |
| B-    | 77 – 79%       |  | F     | 0 – 49%        |

#### LATE ASSIGNMENTS POLICY

If you expect to be late on an assignment for an excusable reason, please notify the instructor well in advance, and he may arrange an alternative schedule. However, due to the collaborative nature of the course, punctuality will be key.

## INCOMPLETE GRADE POLICY

The University policy states that a student who is passing a course but has not completed all work due to exceptional circumstances, may, with consent of the instructor, temporarily receive a grade of incomplete ("I"). The assignment of the "I" grade is at the discretion of the instructor but is allowed only if the student is passing the course.

## RESEARCH-INTENSIVE (RI) DESIGNATION

This course contains an assignment designed to help students conduct research and inquiry at an intensive level. If this class is selected to participate in the university-wide assessment program, students will be asked to complete a consent form and submit electronically some of their research assignments for review. Visit the Office of Undergraduate Research and Inquiry (OURI) for additional opportunities and information at <http://www.fau.edu/ouri>.

This URI portion of the course will address all six Student Learning Objectives:

1. Knowledge. Students will demonstrate mathematical knowledge by applying math to real-world problems.
2. Formulate Questions. Students will translate questions from industry partners into precise mathematical questions that they might answer.
3. Plan of Action. The students will map out their research project over the course of a semester to come to a reasonable end product.
4. Critical Thinking. Students will analyze their topics critically.
5. Ethical Conduct. Students will behave ethically with their industry partners and their teammates, and they will review standards of academic honesty.
6. Communication. Students will be constantly collaborating with teammates and communicating their results to peers and their industry partners.

## COURSE POLICIES

### CODE OF ACADEMIC INTEGRITY POLICY STATEMENT

Students at Florida Atlantic University should endeavor to maintain the highest ethical standards. Academic dishonesty is a serious breach of these ethical standards because it interferes with the University mission to provide a high-quality education in which no student enjoys an unfair advantage over any other. Academic dishonesty is also destructive to the university community, which is grounded in a system of mutual trust and places high value on personal integrity and individual responsibility. Harsh penalties are associated with academic dishonesty. For more information, see [University Regulation 4.001](#).

## **RULES OF CLIENT ENGAGEMENT:**

Each team will be in contact with a client from industry for their project. I must approve all emails to this contact. Meetings with the client require the utmost respect, and students will dress professionally for any face-to-face meetings (whether in person or through video conferencing). Presentations to clients must be prepared carefully in advance. Don't get caught late in the game and have to tell the client that you aren't prepared. In order to stay on track to meet deadlines and to arrive at a deliverable final product, understand that you will need to devote substantial time outside of class.

## **PLAGIARISM**

[Plagiarism](#) is unacceptable in the University community. Academic work must be an original work of your own thought, research, or self-expression. When students borrow ideas, wording, or organization from another source, they must acknowledge that fact in an appropriate manner. Plagiarism is the deliberate use and appropriation of another's work without identifying the source and trying to pass off such work as one's own. Any student who fails to give full credit for ideas or materials taken from another has plagiarized. This includes all discussion board posts, journal entries, wikis, and other written and oral presentation assignments. If in doubt, cite your source.

## **CLASSROOM ETIQUETTE/DISRUPTIVE BEHAVIOR POLICY STATEMENT**

Disruptive behavior is defined in the FAU Student Code of Conduct as "... activities which interfere with the educational mission within classroom." Students who disrupt the educational experiences of other students and/or the instructor's course objectives in a face-to-face or online course are subject to disciplinary action. Such behavior impedes students' ability to learn or an instructor's ability to teach. Disruptive behavior may include but is not limited to non-approved use of electronic devices (including cellular telephones); cursing or shouting at others in such a way as to be disruptive; or, other violations of an instructor's expectations for classroom conduct.

For more information, please see the [FAU Office of Student Conduct](#).

## **COMMUNICATION POLICY**

### **EXPECTATIONS FOR STUDENTS**

#### **Announcements**

You are responsible for reading all announcements posted by the instructor. Check the course announcements each time you log in.

### **Email/Video Conferencing**

You are responsible for reading all your course email and responding in a timely manner.

### **Course-Related Questions**

Post course-related questions to the FAQ discussion board. This allows other participants with the same question to benefit from the responses. Also, make sure you review this forum prior to posting a question. Someone may have already asked and answered the question in previous posts.

## **INSTRUCTOR'S PLAN FOR CLASSROOM RESPONSE TIME & FEEDBACK**

### **Email/Video Conferencing Policy**

Except for weekends and holidays, the instructor will typically respond to email (Canvas inbox or FAU email) within 48 hours. You should ask course-related questions in the FAQ discussion board. If you have questions of a personal nature, you should email the instructor.

### **Assignment Feedback Policy**

The instructor will provide feedback on submitted assignments within one week of the submission date. Some assignments may require a longer review period, which the instructor will communicate to you.

### **Course-Related Questions Policy**

Except weekends and holidays, the instructor will generally answer questions within 48 hours.

### **Electronic Communication Policy**

In addition to the University's policy, please consider the following:

- Privacy, confidentiality, and security in all electronic communications.
- All electronic communication resources must be used for the course and in alignment with to the University mission.
- Prohibited use of false identity, false identity pseudonyms, or anonymous (sender's name or electronic identification is hidden).
- Access without consent.
- Disruption of services including introducing computer contaminants (viruses).
- Harassment of any kind.

Please see the Office of Information Technology's policies on [Cyber Security Awareness](#).

## SUPPORT SERVICES & ONLINE RESOURCES

- [Center for eLearning and Student Success](#)
- [Counseling and Psychological Service \(CAPS\)](#)
- [FAU Libraries](#)
- [Freshmen Academic Advising Services](#)
- [Math Learning Center](#)
- [Office of Information Technology Helpdesk](#)
- [Office of International Programs and Study Abroad](#)
- [Office of Undergraduate Research and Inquiry](#)
- [Student Accessibility Services](#)
- [University Center for Excellence in Writing](#)

## CAPS STATEMENT

Life as a university student can be challenging mentally, emotionally, and physically. Students who find stress negatively affecting their ability to achieve academic or personal goals may wish to consider utilizing FAU's Counseling and Psychological Services (CAPS) Center. CAPS provides FAU students a range of services to help improve and maintain well-being. For CAPS services, students need to be currently enrolled, have paid the health fee, be physically located in Florida when services are provided, have phone or videoconferencing capabilities, and have access to a safe/private location for sessions. For those outside of Florida, CAPS will assist students in getting connected to services/providers in your area for ongoing support. For more information, go to <http://www.fau.edu/counseling/> or call 561-297-3540.

## FACULTY RIGHTS & RESPONSIBILITIES

Florida Atlantic University respects the rights of instructors to teach and students to learn. Maintenance of these rights requires classroom conditions that do not impede their exercise.

**To ensure these rights, faculty members have the prerogative to:**

- Establish and implement academic standards.
- Establish and enforce reasonable behavior standards in each class.
- Recommend disciplinary action for students whose behavior may be judged as disruptive under the *Student Code of Conduct*.

## SELECTED UNIVERSITY & COLLEGE POLICIES

### ACCESSIBILITY POLICY STATEMENT

In compliance with the Americans with Disabilities Act (ADA), students who require special accommodations to properly execute coursework due to a disability, must register with Student Accessibility Services (SAS) located in the Boca Raton, Davie, and Jupiter campuses and follow all SAS procedures. For additional information, please consult [Student Accessibility Services](#).

#### Contact

- **Boca Raton:** (561) 297-3880  
Fax: (561) 297-2184, TTY: 711
- **Davie:** (954) 236-1222  
Fax: (954) 236-1123, TTY: 711
- **Jupiter:** (561) 799-8721  
Fax: (561) 799-8721, TTY: 711

### GRADE APPEAL PROCESS

You may request a review of the final course grade when you believe that one of the following conditions apply:

- There was a computational or recording error in the grading.
- The grading process used non-academic criteria.
- There was a gross violation of the instructor's own grading system.

[Chapter 4 of the University Regulations](#) contains information on the grade appeals process.

### RELIGIOUS ACCOMMODATION POLICY STATEMENT

In accordance with rules of the Florida Board of Education and Florida law, students have the right to reasonable accommodations from the University in order to observe religious practices and beliefs regarding admissions, registration, class attendance, and the scheduling of examinations and work assignments. For further information, please see [Academic Policies and Regulations](#).

### UNIVERSITY APPROVED ABSENCE POLICY STATEMENT



In accordance with rules of the Florida Atlantic University, students have the right to reasonable accommodations to participate in University approved activities, including athletic or scholastics teams, musical and theatrical performances and debate activities. It is your responsibility to notify the instructor at least one week prior to missing any course assignment.

## **DROPS/WITHDRAWALS**

You are responsible for completing the process of dropping or withdrawing from a course. Please click on the following link for more information on dropping and/or withdrawing from a course. Please consult the [FAU Registrar Office](#) for more information.

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**The instructor reserves the right to adjust this syllabus as necessary.**